

McMICHAEL

393

Four-valve battery superhet with six push buttons (mechanically operated). Output is QPP and three wavebands are covered. Made by McMichael Radio, Ltd., Cray Avenue, Orpington, Kent.

Circuit.—On SW the aerial is coupled by L2 to the SW tuning coil L3, which has a fixed trimmer C6 across it, in addition to the variable trimmer T6. Aerial coupling on MW and LW is by L4 to L5 (MW) and L6 (LW). Variable trimmers T8 and T10 are provided for these circuits. C4 is an additional fixed top coupling condenser for the MW coil while C5 shorts, in the HF sense, L6 on MW.

On MW, C2 is shorted to earth, but is in parallel with L4 on LW and additional coupling to the tuning coils is provided via C3.

C1 and L1 (which has an adjustable iron dust core) comprise an IF filter in the aerial circuit, with R1 as an aerial to earth shunt.

Signals from the tuned circuits are applied to the control grid of V1, a triode-pentode whose triode section is connected to the oscillator coils L7—L11. L7 is the SW reaction coil and L9 the MW and LW reaction winding, all of

which are coupled to the grid by R4 and C12, with R3 as the grid to filament resistance. R2 is a stabilising resistance.

L8, L10 and L11 are the SW, MW and LW tuned oscillator coils respectively, and are in the anode circuit of the triode section of V1. The coils are tuned by VC2 and have fixed tracking condensers C7, C9 and C10. Variable trimmers are provided, these being T5 on SW, T7 on MW and T9 on LW. An additional fixed trimmer C11 is across the LW coil L11.

HT to the oscillator anode is fed through R5 and R7, the latter being decoupled by C14. The screen of V1 is connected to HT via R6 and decoupled by C13.

The IF signal from V1 is coupled to V2 by an IF transformer, comprising a primary L12 and secondary L13, which, in addition to their mutual coupling, are influenced by the centre tapped winding L14. The switch S1 (which is ganged to S2) reverses the sense of the coil connection, thus providing a wide band coupling for high fidelity or narrow band coupling for selectivity.

L12 is tuned by T4 and an extra padder C15. The secondary L13 is tuned by T3 and padder C16 and feeds the grid of V2 HF pentode. The screen of this valve is connected to HT by R8 and decoupled by C17. A second IF transformer L15 (tuned by T2) and L16 (tuned by T1) couples V2 to the double diode triode V3.

L16 feeds the signal diode, while the AVC diode is fed from the anode of V2 via C18. R9 and R10 are the AVC load resistances with maximum bias applied to the grid of V1 through decoupling components R12, R13, C19 and C3.

The grid of V2 has AVC applied from the junction of R9 and R10 through R14 decoupled by C20. The signal diode load, R16, is fed through an IF filter R15, C22. The LF signal is coupled by C23 to the volume control R17, the slider of which connects to a grid stopper R18 and thence to the grid of the triode section of V3.

Bias for V3 is obtained from R11 in the HT negative circuit. This bias is applied to the triode grid and to the AVC diode for delay purposes, but not to the signal diode.

V3 is resistance/capacity coupled by R19 and C25 to the intervalve transformer, the primary of which is L17. This winding is shorted by a muting switch, S3, when any of the press buttons are operated thereby preventing reproduction from unwanted stations as the tuning condenser is rotated by the mechanism of the press-button assembly.

L17 is also shunted by the tone control components C26, C27 and S2, which is ganged to S1.

The outers of L18 feed the grids of the two sections of the QPP double pentode V4, the centre tap going to R20 grid stopper and then to R12 for grid bias. C28 decouples R11 and R12.

The output of V4 is coupled to the moving coil speaker by the matching transformer comprising L19, L20. The primary L19 has tone correction condensers C29 and C30 connected between each outer and earth.

Extra loudspeaker sockets are provided for a low impedance speaker. This should match L21, which has a DC resistance of just over 2 ohms.

The HT supply is shunted by C31 and

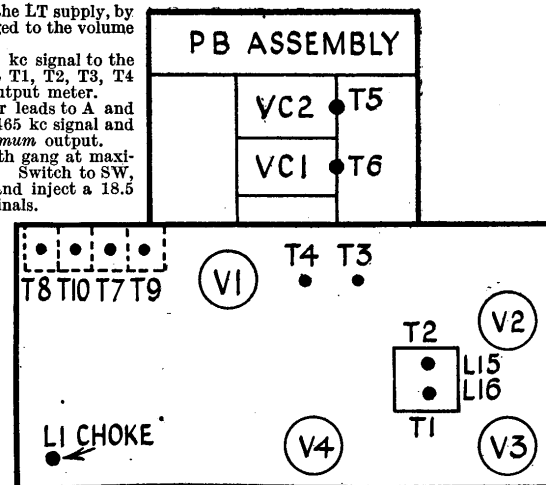
is controlled, together with the LT supply, by the switch S4, which is ganged to the volume control R17.

IF Circuits.—Inject a 465 kc signal to the control grid of V1. Adjust T1, T2, T3, T4 for maximum reading of output meter.

Connect service oscillator leads to A and E terminals, inject strong 465 kc signal and adjust core of L1 for minimum output.

SW Band.—Check that with gang at maximum, pointer is horizontal. Switch to SW, rotate gang to minimum and inject a 18.5 m. signal to A and E terminals.

Top-of-chassis layout diagram showing the location of the principal features. Trimmer positions are indicated, those in dot line being accessible from below.

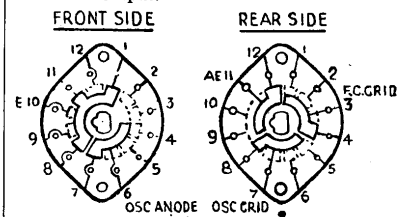


Adjust T5 for maximum output.

Tune to 19.6 m. on scale, inject 19.6 m. signal and adjust T6 for maximum output.

MW Band.—Return gang to minimum and switch to MW. Inject a 190 m. signal and adjust T7 for maximum output. Tune to 214 m. on scale, inject 214 m. signal and adjust T8 for maximum output.

LW Band.—Switch to LW and set pointer to 1,100 m. mark on scale. Inject 1,100 m. signal and adjust T9 and T10 in that order for maximum output.



As already stated, the tracking condensers are fixed, so there are no further adjustments to be made at higher scale calibrations.

PB Adjustments.—Tune in required station as accurately as possible by manual tuning after pressing in the tuning knob.

Unscrew the button to be used a few turns and fully depress it without jerking, which might upset the gang. Screw up button.

VALVE READINGS

V	Type	Electrode	Volts	Ma
V1	TP25	Anode	112	.6
		Osc. anode	50 (70 on S.W.)	1.9
		Screen	50	.7
V2	VP23	Anode	112	1.1
		Screen	45	.4
V3	HL23DD	Anode	80	.7
		Grid	1.1	—
V4	QP25	Each anode	110	2.3
		Screen	112	1.3
		Grid	8.2	—

RESISTANCES

R	Ohms	R	Ohms
1	2,000	11	120
2	1,500	12	200
3	50,000	13	500,000
4	100	14	1 meg.
5	40,000	15	50,000
6	100,000	16	500,000
7	20,000	17	1 meg.
8	200,000	18	100,000
9	500,000	19	50,000
10	500,000	20	100,000

CONDENSERS

C	Mfd	C	Mfd
1	400 mmfds	16	50 mmfds
2	.004	17	.1
3	.1	18	.0001
4	6 mmfds	19	.01
5	.001	20	.1
6	25 mmfds	21	.0001
7	3,700 mmfds	22	.0001
8	5 mmfds	23	.005
9	507.5 mmfds	24	.0003
10	168 mmfds	25	.1
11	50 mmfds	26	.02
12	.0001	27	.01
13	.1	28	50
14	.1	29	.001
15	50 mmfds	30	.001
		31	8

